

### REMARKS

Claims 1-23 are pending in the application. Claims 1, 10, and 18 have been amended by incorporating the subject matter of claim 2 therein. Claims 2, 22, and 23 have been amended for consistency. Favorable reconsideration in light of the amendments and remarks which follow is respectfully requested.

#### The Enablement Rejection

Claims 2 and 18-21 have been rejected under 35 U.S.C. § 112, first paragraph, for enablement with regard to an AWG spectrometer. The Examiner specifically contends that the specification does not disclose how to make and use an AWG spectrometer.

It is noted that a spectrometer measures the intensity of radiation as a function of wavelength. In other words, a spectrometer spreads radiation into different wavelengths and analyzes the spectra of radiation. An AWG contains two mutliport couplers interconnected by an array of waveguides. The grating structure of the AWG provides wavelength dispersion. The main function of an AWG is to isolate or combine multiple optical communications signals occurring in discreet wavelength bands.

While it is acknowledged that using an AWG spectrometer is one of the novel aspects of the invention, it is noted that an AWG in and of itself is not new. In this connection, methods of making AWGs are known skilled in the art. However, using an AWG as/in a spectrometer, owing to the ability of an AWG to spread radiation into different wavelengths, is not known to those skilled in the art. The instant specification's disclosure of an AWG as/in an AWG spectrometer is the enabling disclosure of using an AWG spectrometer, because one skill in the art is consequently in possession with sufficient information to employ an AWG as/in an AWG spectrometer. Since the AWG highly resolves wavelengths of light, analysis such as the intensity measurements of the resolved wavelengths is facilitated.

Although those skilled in the art do not recognize to use an AWG for spectroscopic analysis across a continuous range of wavelengths (i.e., as a

spectrometer), this does NOT mean that those skilled in the art could NOT use an AWG for spectroscopic analysis if they were informed of such possibility. The instant specification provides the enabling disclosure that an AWG may be effectively used for spectroscopic analysis, and combining this information with what is already known about AWGs, the use of an AWG as/in an AWG spectrometer is indeed enabled.

Furthermore, in the instant specification, pages 16-20 describe the operation and use of an AWG spectrometer. The specification explains that OICs in general and an AWG in particular are compact and can efficiently analyze the SPR signal generated at the assay locations.

In sum, the instant specification provides an enabling disclosure an AWG spectrometer. Methods of making AWGs are known, while spectrometric methods of using the AWG are taught by the instant specification.

#### The Amendments

The independent claims have been amended to specify that the optical integrated circuit contains an AWG spectrometer. Support exists in original claim 2. Claim 2 has been amended to better describe the AWG spectrometer. Support exists in the specification, for example, page 17, line 28.

#### The Obviousness Rejection

Claims 1, 3-17, and 22-23 have been rejected under 35 U.S.C. § 103(a) over Hoppe et al (U.S. Patent 6,570,657) in view of Naya (U.S. Patent 5,917,607), the specification, and Verber et al (U.S. Patent 4,394,060).

Hoppe et al relates to an arrangement for surface plasmon resonance (SPR) spectroscopy. Broadband light is sent through a fiber, into a collimator, and then through a prism and onto the bottom of a sample cell. Reflected light travels through the prism, another collimator and fiber, and finally into a polychromator. The advance involves the use of a diaphragm between the collimator and prism on the front end to split up light to different areas. Hoppe et al does not employ an AWG spectrometer in

its SPR arrangement. Instead, Hoppe et al employs free space optics and optical fiber in analyzing its SPR signal.

Naya relates to an SPR system involving directing light into a prism to a sample, and detecting light intensities with a CCD, for example. Naya does not employ an AWG spectrometer in its SPR system. Instead, Naya employs free space optics in analyzing its SPR signal.

Verber et al relates to a light beam scanning system for scanning laser light through an optical waveguide. Light generated by a diode laser is sent via a waveguide through a collimator and surface acoustic wave, a prism-coupler, and then an imaging lens. Verber et al does not relate to SPR devices or techniques. Verber et al does not mention, teach, or suggest an AWG or use of an AWG as an AWG spectrometer.

The Examiner contends that it would have been obvious to use the scanning system of Verber et al as a scanner in the SPR devices of Hoppe et al and Naya. The Examiner contends that the motivation to do so resides in Verber et al, even though Verber et al does not relate to SPR devices. Applicants respectfully disagree.

There would have been no motivation for one skilled in the art to employ the light beam scanning system of Verber et al in the SPR devices of Hoppe et al and Naya. Verber et al makes no mention of SPR systems while Hoppe et al and Naya make no mention nor make any motivation to employ an optical integrated circuit therein. Since there is not teaching or suggestion in any of Verber et al, Hoppe et al, and Naya that the scanning device of Verber et al would improve the SPR method of Hoppe et al and/or Naya, there would have been no motivation for one skilled in the art to incorporate the scanning device of Verber et al into the SPR systems of Hoppe et al and/or Naya. For at least this reason, withdrawal of the rejection is respectfully requested.

Moreover, although Applicants do not concede that one skilled in the art would combine Verber et al, Hoppe et al and/or Naya, it is noted that the alleged combination is insufficient because there is no mention of an AWG or an AWG spectrometer. That is, neither Verber et al, Hoppe et al nor Naya disclose, teach or suggest an AWG or an AWG spectrometer. The AWG spectrometer of the claimed invention permits the

beneficial elimination of free space optics, which are characterized by mechanical instability, poor repeatability, large in physical size, and low reliability. Moreover, the AWG spectrometer provides the claimed invention with extremely high resolution (on the order of one angstrom wavelength resolution) that cannot be obtained using the methods and devices of the cited art. In other words, there is NOTHING in the cited art even equivalent to the AWG spectrometer of the claimed SPR systems and methods. For this additional reason, withdrawal of the rejection is respectfully requested.

Petition for Extension of Time

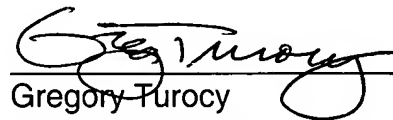
A request for a one month extension of time is hereby made (small entity status has been established). A Credit Card form is provided to charge the fees for the One Month Petition.

Should the Examiner believe that a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to our Deposit Account No. 50-1063.

Respectfully submitted,

**AMIN & TUROCY, LLP**



Gregory Turocy  
Reg. No. 36,952

24<sup>th</sup> Floor, National City Center  
1900 East 9<sup>th</sup> Street  
Cleveland, Ohio 44114  
(216) 696-8730  
Fax (216) 696-8731